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FOREST INSECT AND DISEASE
CONDITIONS IN ALASKA
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FOREST INSECT AND DISEASE CONDITIONS IN ALASKA

R-10, 1985

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Forest Pest Management
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FOREST INSECT AND DISEASE CONDITIONS IN ALASKA: 1985

CONDITIONS IN BRIEF

Spruce bark beetle activity continued to cause the most mortality to forested areas in Alaska during 1985. Infestations covered approximately 255,270 acres; a 41% decrease from 1984 levels. Substantial decreases in spruce beetle activity were apparent on the Chugach National Forest and on the west side of Cook Inlet. Bark beetles have killed the majority of susceptible host material in these areas. However, beetle infestations are expanding in some areas of the Kenai National Wildlife Refuge as well as in the Anchorage bowl and Eagle River areas. Engraver activity in interior Alaska remains endemic; infestations increased slightly to 1,072 acres. Larch beetle activity was not apparent in 1985.

Defoliator populations declined substantially in interior Alaska. Large aspen tortrix populations near Tetlin and Big Delta decreased from 18,200 acres of aspen defoliation in 1984 to 2,185 acres defoliated in 1985. Likewise, spear-marked black moth defoliation decreased. In 1984, 315,793 acres of paper birch were defoliated near Fairbanks. Defoliation occurred on only 35,195 acres in 1985. Approximately 31,371 acres of paper birch were lightly to moderately defoliated by leaf rollers on the west side of Cook Inlet.

Spruce needle rust levels remain low throughout interior Alaska although a slight increase in infection levels was noted in 1985. 1,402 acres of infected white spruce were detected in interior Alaska in 1985.

In southeast Alaska, the most significant forest insect pest in 1985 was the hemlock sawfly. Populations and total defoliated acres declined from 1984 levels, but damage caused in previous years became apparent in the southern part of the Tongass National Forest. Scattered to heavy top-kill and hemlock mortality was evident on nearly 7,800 acres, predominantly on central and southern Prince of Wales Island and Dall Island. Currently the sawfly is most active in the northern third of Kuiu Island where 9,000 acres showed light to moderate defoliation. The spruce beetle infestation in Glacier Bay National

Park continued to expand, and now covers 12,200 acres in the lower bay. The most significant disease losses in 1985 were in old-growth forests and were caused by hemlock dwarf mistletoe, decay fungi, and Alaska-cedar decline. These diseases cause persistent losses without much fluctuation from year to year; however, mortality from Alaska-cedar decline was more severe this year than in the several preceding years. Three shoot or needle diseases (Sirococcus shoot blight, spruce needle rust, and spruce needle cast) occurred at increased infection levels this year in young stands. A canker disease, probably caused by Xenomeris abietis, was prevalent along roads on Prince of Wales Island and killed small western hemlocks and the lower crown of larger hemlocks. Animals damaged trees in southeast Alaska forests with porcupines feeding on young-growth Sitka spruce and western hemlock, brown bears scarring the bases of Alaska-cedars, and squirrels girdling the tops of western redcedars.

STATUS OF INSECTS

SPRUCE BEETLE, Dendroctonus rufipennis (Kirby)

Alaska spruce beetle infestations have decreased by 40% from levels infested in 1984; infestations (on-going as well as new) cover approximately 255,270 acres. This decrease, discussed in the following sections was most apparent on the Chugach National Forest and the west side of Cook Inlet.

White and Sitka spruce mortality continues on 31,158 acres of the Chugach National Forest; a decrease of 45% over the area infested in 1984. Infestations will continue to decrease as the amount of susceptible host material declines after more than ten years of beetle activity. Increased beetle activity however, is apparent in the Cooper Landing-Russian River areas. Infestations will continue to expand and intensify in these areas.

Spruce beetle infestation in the Summit Lake area, Chugach National Forest

Spruce beetle activity is apparent on the Kenai National Wildlife Refuge where 43,326 acres are currently infested; a 28% decrease from 1984 levels. However, beetle activity is still quite high in the Mystery Hills and Skilak Lake areas where 50,457 acres are infested. Spruce beetle activity is expected to decline in these areas in the next few years. Infestations are declining along the Fox River drainage near Homer where 366 acres of infested spruce are scattered over 16,000 acres. Of interest is the increase in spruce beetle activity along Kachemak Bay directly across from Homer. About 200 hundred acres of infested Sitka spruce were aerially detected near Mallard Bay within Kachemak State Park. It is believed that this increased activity is a result of spruce beetle population buildup in nearby blowdown. An evaluation of the infested area will be undertaken in 1986.

Scattered beetle activity was again apparent in the Anchorage Bowl and Chugiak-Eagle River areas. Other areas of spruce beetle activity were noted along Ship Creek (620 acres), Eklutna Lake (2,027 acres), Chugiak (1,232 acres), and Eagle River (2,022 acres).

Infestations decreased by 63% on the west side of Cook Inlet. Scattered spruce beetle activity was detected north of Beluga Lake on 64,234 acres. Infestations will continue to decline as the amount of susceptible host material declines after more than ten years of beetle activity.

Spruce beetle activity is static to increasing in other localities in south-central and southwestern Alaska. The Tiekel River outbreak along the Richardson Highway increased and now covers more than 5,000 acres. Sanitation/salvage cuts as well as preventive logging practices are currently planned for portions of the infested area. Very light (less than 0.5 tree/acre) beetle activity was once again detected along the Tikakila River near Lake Clark.

In 1985, the only spruce beetle activity in southeast Alaska was in Glacier Bay National Park. The eight-year old infestation expanded to the east and north, and now covers 12,200 acres in the Park. Spruce mortality is quite variable throughout the infested area. Over 50% of the spruce have been killed in the lowlands west of Sitakaday Narrows and on Young Island. The level of mortality is less going eastward through the Beardslee Islands to Bartlett Lake, with

10-20% of the spruce dead on the eastern mainland.

A cold May and June delayed beetle flights until early July, and consequently, successful beetle attacks were not as prominent in 1985 as they were in 1984. Further expansion of the outbreak is expected in 1986, with the extent of damage being highly dependent on prevailing weather conditions during the spring and summer.

1985 spruce beetle infestations by ownership are as follows: National Forest Land--34,101 acres; State and private--130,525 acres; and other Federal lands (e.g. Kenai National Wildlife Refuge, National Parks, etc.)--91,588 acres.

ENGRAVERS, Ips perturbatus (Eichh.)

Engraver populations remain at endemic levels throughout interior Alaska. Approximately 1,050 acres of scattered infested white spruce were aerially detected in 1985; a 80% increase over levels infested in 1984.

SPRUCE BUDWORMS, Choristoneura spp.

The expected heavy budworm defoliation between Copper Center and Chitina did not occur although populations were high. An unusually cool and late spring was, in part, responsible for the reduction in defoliation levels. Since C. orae exhibits a high percentage of second diapause, we can expect relatively little budworm activity in these areas next year.

Trapping studies using synthetic budworm pheromones were undertaken throughout Alaska to delineate the budworm species complex. Results of these studies indicated that in southeast Alaksa, most trapping localities (Sitka spruce) indicated the presence of C. fumiferana/occidentalis with the exception of Ketchikan which had a high incidence of C. orae. Trapping studies in southcentral's white and Sitka spruce forests indicated that C. orae is the only species present. Interior Alaska's white spruce forests contain a mixture of C. orae and probably C. fumiferana.

LARGE ASPEN TORTRIX, Choristoneura conflictana (Wlkr.)

1985 aerial surveys detected tortrix defoliation of quaking aspen on 2,186 acres; a decrease of 9,000 acres over 1984 levels. This is the third consecutive year of decline in tortrix activity. Major areas of defoliation still occur in interior Alaska near Tetlin, Tanana River, and Big Delta.

LEAF ROLLERS, Epinotia solandriana (L.)

1985 aerial surveys detected light to moderate leaf roller defoliation of paper birch on 31,371 acres on the west side of Cook Inlet. Increased leaf roller activity was also observed throughout the Anchorage Bowl. Increased leaf roller defoliation is expected in these areas for the next few years.

SPEAR-MARKED BLACK MOTH, Rheumaptera hastata (L.)

Historically, black moth populations increase rapidly for three to four years followed by an equally rapid decrease caused by the effects of parasitism, predation, and weather. In 1984, 315,793 acres of paper birch were defoliated in interior Alaska. Defoliation decreased by 90% in 1985 (35,195 acres of birch were defoliated) and populations are expected to decrease further in 1986.

WESTERN BLACK-HEADED BUDWORM, Acleris gloverana (Wals.)

Populations of the western black-headed budworm remained at low levels throughout southeast Alaska in 1985. No visible defoliation was detected in the aerial survey, although larval numbers increased slightly at some ground survey locations. Budworm larvae were collected at 26% of the survey plots (comparable to 1985) and were generally in low numbers. The largest number of larvae were found at Hood Bay (Admiralty Island). Other areas with slight increases in budworm larvae included two locations on Chichagof Island (Port Frederick and Patterson Bay), Thorne Bay (Prince of Wales Island), and Saks Cove (Behm Canal). Larvae were also found in the southern part of the Tongass

National Forest at Grace Harbor (Dall Island) and Coning Inlet (Long Island). The most significant decline in larval numbers in 1985 was at Hoonah Sound (Chichagof Island).

SPRUCE NEEDLE APHID, Elatobium abietinum (Walker)

Spruce needle aphid populations declined in 1985, due in part to severly cold days in January throughout most of southeast Alaska. Most urban trees which were damaged in 1984 showed good recovery in 1985, and no new aphid activity was reported.

HEMLOCK SAWFLY, Neodiprion tsugae (Midd.)

The hemlock sawfly was once again the most significant insect problem in southeast Alaska, although defoliation and larval counts dropped off substantially from 1984 levels. In 1985, damage caused by the sawfly was evident on nearly 28,000 acres. This represents a substantial decrease from 1984 where sawfly defoliation was noted on 70,830 acres. Many areas which showed light to moderate defoliation in 1983 (the year of heaviest damage) have

Western hemlock killed by the hemlock sawfly, Dall Island

now fully recovered and much of the past defoliation is no longer visible.

About half of the damage observed in 1985 consisted of light defoliation (15,075 acres). Another 5,100 acres had moderate defoliation, with the remainder showing anywhere from scattered to heavy top-kill and whole-tree mortality (7,800 acres). The acreage figure for light defoliation includes current sawfly feeding as well as previously defoliated areas which have partially recovered but still show remnants of old feeding in the interior crown. For example, some acres of moderate 1984 defoliation may now be decribed as light 1985 defoliation since the current crown symptoms appear nearly the same from the air. The areas with scattered to heavy top-kill and mortality in 1985 are all areas which sustained heavy sawfly defoliation in 1983. As shown in the following table, most of the heavy top-kill and tree mortality was found on northern Dall Island from Breezy Bay to View Cove. Other areas with substantial patches of heavy top-kill and tree mortality are found in the central part of Prince of Wales Island from Skowl Arm to Karta Bay. Specific locations with this heavy damage include Polk Inlet and McKenzie Inlet (Old Tom's Creek). Other areas in central Prince of Wales Island with less concentrated top-kill and mortality of hemlock include Anderson Creek and Flagstaff Creek near Salmon Lake.

ACRES OF HEMLOCK SAWFLY DAMAGE IN 1985

Area	Defoliation		Top-kill and Mortality	
	Light	Moderate	Scattered	Heavy
North Mainland	900	-	-	-
Chichagof Island	1575	2100	-	-
Admiralty Island	300	-	-	-
Kuiu/Kupreanof Isl.	7575	1500	150	-
Wrangell/Etolin Isl.	75	300	-	-
N.Prince of Wales Is	-	-	600	-
Ctr. Prince of Wales	450	750	1500	1350
S.Prince of Wales Is.	2100	-	900	-
Heceta Island	300	-	300	-
North Dall Island	150	-	450	2100
South Dall Island	900	-	450	-
South Mainland	750	450	-	-
TOTAL ACRES	15075	5100	4350	3450

Additional areas on Prince of Wales Island with scattered top-kill include Hole-in-the-Wall (near Labouchere Bay), Big Creek (near Red Bay), Staney Creek, and the area north of Big Salt Lake. Further south, the once heavily defoliated stands in Klakas and Keete Inlet now show patches of top-kill, as do areas on South Dall Island from Pond Bay to Rose Point.

Current sawfly defoliation is most prevalent on Kuiu and Kupreanof Islands. Most of this sawfly activity was concentrated between Security Bay, Kadake Bay, Port Camden, and Bay of Pillars where nearly 9,000 acres sustained light to moderate defoliation in 1985. Other areas with substantial visible damage included Todd, Port Frederick, and the Kadashan River (Chichagof Island), Upper Hetta Inlet from Beaver Creek to Deer Bay (S. Prince of Wales Island), Cholmondeley Sound, and southern Dall Island.

Information from the larval survey showed upward trends in sawfly populations in some areas, and dramatic declines in other areas. Nearly 6,000 larvae were collected at High Island (Rocky Pass), a three-fold increase over 1984 numbers. Defoliation was also substantial on High Island, whereas it had been insignificant in 1984. Other ground plots in the Stikine Area with high or increasing larval counts included Security Bay, Kadake Bay, and Duncan Canal. Further south, subtantial increases in sawfly numbers were noted on Stevenson Island and Thorne Island. In the northern part of the Forest, sawfly larvae increased in several locations on Chichagof and Baranof Islands including Pavlof Harbor, Port Frederick, and Saook Bay. The most dramatic decline was noted at Todd (Chichagof Island)) where most of the damage now visible is probably due to sawfly feeding in previous years. Sawfly numbers declined in 1985 on virtually all the Admiralty Island plots, most notably at Hood Bay, Thayer Lake, Mole Harbor, Gambier Bay, and Tyee. South of Sumner Strait, several plots showed significant declines in sawfly numbers (Bradfield Canal, Port. Camden, Thorne Bay, Edna Bay, Cholmondeley Sound, and Dora Bay).

Total larval numbers were about half the number collected in 1984, but positive collections were made at 67% of the ground plots. This suggests that although the sawfly is apparently declining, we can still expect further damage to occur in 1986, especially in the central and northern parts of the Forest.

LOOPERS, Geometridae

Populations of all geometrid defoliators of hemlock were extremely low in 1985. The most abundant geometrid, the saddleback looper (Ectropis crepuscularia) was found on 29% of the ground plots, but occurred in low numbers and caused no visible defoliation.

COTTONWOOD LEAF BEETLE, Chrysomela walshii

Populations of the cottonwood leaf beetle were substantially higher in 1985 than in several previous years. Numerous homeowners in the Mendenhall Valley (Juneau) reported defoliation of ornamental black cottonwood and willow. Outside of urban areas, no leaf beetle defoliation was observed. Moderate leaf beetle defoliation of black cottonwood and balsam poplar was observed for the second year along Turnagain Arm southeast of Anchorage.

SPRUCE BUD MIDGE, Dasineura swainei Felt.

Bud midge damage is still prevalent throughout the Kenai Peninsula. The occurence of the bud midge is suspected in southeast as well as interior Alaska's spruce forests.

Developing larvae overwinter and new adults emerge the following spring. At this time the galled bud becomes rosette-like due to drying and recurving of the bud scales.

Galls are most numerous on the sunny sides and tops of open-grown trees. When the leading bud is attacked, a crook in the stem develops but is probably overgrown before the tree reaches pole size. In some cases however, multiple leaders result.

STATUS OF DISEASES

HEMLOCK DWARF MISTLETOE, Arceuthobium tsugense (Rosendhal) G.N. Jones

This seed-bearing parasite continued to be the most destructive disease of old-growth western hemlock. It rarely infects mountain hemlock or Sitka spruce. Hemlock dwarf mistletoe infests a high proportion of old-growth stands in southeast Alaska between Portland Canal and Haines. Recent research indicates that mistletoe infection levels are much lower in young-growth stands than were previously suspected. Also, many of the infections are located in the lower one-third of the crown--a location that limits their ability to spread the disease. A demonstration area near Thorne Bay on Prince of Wales Island is being installed to provide information on the recognition, biology, and impact of this parasite and, in particular, to demonstrate techniques for managing young-growth stands in cutover areas to minimize losses from this disease.

SIROCOCCUS SHOOT BLIGHT, Sirococcus strobilinus Pruess.

The incidence of this disease increased markedly throughout southeast Alaska over levels recorded in recent years, probably as a result of the cool and moist spring of 1985. The fungus causing this shoot blight is indigenous to southeast Alaska. It infects and kills the shoots of western hemlock, and to a lesser degree, shoots of Sitka spruce. Shoot mortality was most common in young-growth stands in southeast Alaska; however, understory western hemlock trees in old-growth forests were sometimes infected.

The disease was most severe in unthinned young-growth stands where cool, moist air can stagnate--a condition that favors sporulation and infection by the fungus. Shoot infection occurred throughout the growing season on western hemlock. Hemlocks in thinned stands had fewer infections and those present were concentrated in the lower portions of the live crown where they have less effect on tree growth and cannot distort the terminal leader.

SPRUCE NEEDLE RUST, Chrysomyxa ledicola Lagerh.

Spruce needle rust was more abundant throughout southeast Alaska this year. The spores of this rust fungus that infect spruce needles are produced on the alternate host, Labrador-tea (Ledum sp.). Since Labrador-tea grows primarily on muskegs, only spruces in and around muskegs were heavily infected. Sitka spruce trees growing in young stands had, at most, only a light incidence of infection. Because only current-year needles of spruce are attacked by this fungus, infected trees will not be greatly affected unless thay receive heavy infection for several consecutive years.

White spruce infected with spruce needle rust

Spruce needle rust was aerially detected on 1,402 acres of white spruce near Delta Junction in interior Alaska. Likewise, levels of needle rust infected spruce increased throughout the Kenai Peninsula.

SPRUCE NEEDLE CAST, Lirula macrospora (Hartig) Darker

This needle cast fungus occurred at increased levels this year, primarily on Sitka spruce in second-growth stands in southeast Alaska. Infected spruce needles will propably produce abundant fungal spores next spring, and if weather conditions are favorable, more infection can be expected next year. Lirula probably infects current-year needles of spruce, but observeable symptoms do not become apparent until these needles are one year old. The fungus only sporulates on needles that are at least two years old and are dead. The timing of sporulation will be monitored over the next several years to determine when best to protect ornamental spruce trees from infecting spores.

OTHER CONIFER FOLIAGE DISEASES

The following diseases occurred on conifer foliage in southeast Alaska, but were present at low levels and causing minimal damage in 1985:

Hemlock Needle Rust, Pucciniastrum vaccinii (Rab.) Joerst.
On: Western hemlock

Cedar Leaf Blight, Didymascella thujina (Durand) Maire
On: Western redcedar

Alaska-cedar Rust, Gymnosporangium nootkatense Arth.
On: Alaska-cedar

Juniper Leaf Cast, Lophodermium juniperinum (Fries) de Notaris
On: Juniperus sp. (this fungus, found in the Juneau area, had not been previously reported from Alaska)

HEMLOCK CANKER, Xenomeris abietis Barr

A canker disease killed small hemlocks and the lower crowns of larger hemlocks along portions of the road system on Prince of Wales Island. This disease was not found in second-growth stands, but was always located in the understory and lower branches on old trees of old-growth stands within

several hundred feet of roads. The most severe damage occurred along roads in the following areas: Klawock, Klawock Lake, Craig, Sweetwater Lake, Sarkar Lake, Red Bay, and Labouchere Bay. Another fungus, Nectria sp., was found on many of the dead hemlocks and could be contributing to the death of these trees. Dust and other associations with roads may weaken hemlocks, allowing these fungi to establish infections. This disease will be monitored in the future and the distance that it occurs from roads into forests will be surveyed next year.

Young western hemlock killed by Xenomeris canker

WESTERN GALL RUST, Endocronartium harknessii (J.P. Moore) Hirat.

This rust fungus caused perennial round galls on shore pine and was common throughout southeast Alaska. The fungus does not typically kill pine limbs, but interferes with the pine's hormones resulting in galls. This year a fungus, Nectria macrospora, was found attacking and killing these galls. The result of Nectria attack was death of limbs from the gall

outward. Such damage was found on pines near Gustavus and on Prince of Wales Island.

HEMLOCK STEM DISEASE, Foveostroma abietinum (Peck) D. Cosmo

This fungus, not previously reported from Alaska, was collected and isolated from a dying hemlock in a young-growth stand on Mitkof Island. It was also collected on very recently thinned stems of western hemlock, Sitka spruce, and shore pine on Mitkof Island. This is the furthest west, and probably the furthest north, collection of this fungus. It is considered to be weakly pathogenic when it occurs on balsam fir. Pathogenicity tests will be conducted on western hemlock and Sitka spruce next year to determine if this fungus is a potential threat to young-growth stands in southeast Alaska.

ALASKA-CEDAR DECLINE

Alaska-cedar decline persists as one of the most important forest diseases in southeast Alaska. More Alaska-cedars died this year than in the preceeding several years, but some trees have probably died throughout southeast Alaska every year since the onset of the problem about 100 years ago. Mortality began on muskeg sites and has subsequently encroached onto better drained, more productive sites. No site-to-site spread has yet been found, suggesting that the causal factor is not a contagious organism. More than 50 species of fungi have been isolated or collected from dying trees, but none have the pathogenic ability to cause the large-scale, extensive mortality. The Phytophthora species isolated last year is either absent, or occurs at low levels, in stands expressing decline and is probably not the primary cause of mortality. The patterns of tree death and apparent absence of a pathogen as the primary incitant, suggest that some form of environmental stress may be the cause of the problem. Alaska-cedar regeneration is sparse or absent in most stands with dying cedars.

Results from future work will determine the feasibility of salvaging dead Alaska-cedar and how best to regenerate Alaska-cedar in stands with this mortality problem.

HEMLOCK FLUTING

Fluting on the boles of western hemlock continues to be a problem throughout southeast Alaska. Hemlocks with fluting have deeply incised grooves and ridges along their boles, a condition that reduces the value of hemlock logs because they yield less sawlog volume and bark is contained in some of the wood. The cause of fluting is not known, but researchers are currently exploring reasons for this hemlock bole deformation and possible means to discriminate against the problem in young stands.

DECAYS

Wood decay of living trees continues to be one of the most important losses of wood volume in Alaska forests. The problem is particularly acute in old-growth forests, where slow growing decay fungi have ample time to cause significant losses. The following fungi have been shown to cause most of the decay in southeast Alaska forest trees:

Sitka spruce-

- Fomitopsis (Fomes) pinicola
- Phellinus (Fomes) pini
- Armillaria sp.
- Laetiporus (Polyporus) sulphureus
- Phaeolus (Polyporus) schweinitzii

Western hemlock-

- Fomitopsis (Fomes) pinicola
- Armillaria sp.
- Heterobasidion (Fomes) annosum

Laetiporus (Polyporus) sulphureus
Phaeolus (Polyporus) schweinitzii
Phellinus (Fomes) robustus
Phellinus (Fomes) pini

Western redcedar-
Poria albipellucida
Phellinus (Poria) weirii

A heart rot of live white spruce was observed in numerous stands in southcentral Alaska. Next year, studies will be conducted to determine the fungi responsible for this decay, their geographical distribution, parts of trees affected, and resulting losses of wood volume.

STATUS OF ANIMAL DAMAGE

BROWN BEAR, Ursus arctos

Brown bears caused basal scars on Alaska-cedar on Baranof and Chichagof Islands, particularly in the Peril Strait and Slocum Arm areas. Approximately one half of Alaska-cedar trees in those areas have at least one basal scar. Cedars growing on the best developed soils, where they mix with a higher proportion of western hemlock and Sitka spruce, have an even higher incidence of scarring. Most scars at the base of cedars were produced many years ago and now have deep callus folds. Every year, however, bears scar cedars in the springtime by tearing bark away from the tree base with their teeth.

Brown bear caused basal scars of Alaska-cedar

PORCUPINE, Erethizon dorsatum

Porcupine damage was noted on Mitkof Island in young stands of Sitka spruce and western hemlock following precommercial thinning. The effects of porcupine feeding are evident throughout the island, particularly in stands along the Falls Creek road and along Blind Slough. In some cases, about 10% of the crop trees have been girdled and killed. Survey transects have been established on the island to determine the extent of damage and assess population trends of the animals in thinned stands.

Reasons for this scarring are unknown; no other evidence of feeding is present. Perhaps bears lick the exposed cambium for the high concentration of sugars that occur in spring. Wood behind and adjacent to older scars is often decayed—a condition that will cause substantial cull-loss in butt logs if these stands are logged.

OTHER MAMMALS

The tops of sapling to pole sized western redcedars were girdled last winter by some mammal. These girdlings resulted in the death of approximately the top three to six feet of these trees. Affected trees occurred on the mainland, Prince of Wales Island, and several smaller islands near Prince of Wales Island. Red squirrels and Northern flying squirrels are likely candidates for this damage.

Possible red squirrel girdling of western redcedar

INTEGRATED PEST MANAGEMENT ACTIVITIES

Integrated pest management has been described as a "systems approach to reducing pest damage to tolerable levels through a variety of techniques, including predators and parasites, genetically resistant host, natural environmental modifications and, when necessary and appropriate, chemical pesticides." Considering the broad parameters offered by this definition a listing of Region 10 IPM activities conducted by FPM is as follows:

(1) A continuation of the testing of two chemicals-Lindane and Sevin-and a synthetic pulp mill by-product known as pine oil as to their effectiveness in preventing spruce beetle attacks. Three years after treatment, both Lindane and Sevin provided more than 90% protection of white spruce to spruce beetle attacks. This data will be used to obtain an extension for Sevin as a protective spray. The pine oil treatments provided adequate control through the first beetle flight; less control through the second major flight in July. Future testing of the pine oil fractions is planned for 1986.

(2) The evaluation of methylcyclohexenone (MCH) in preventing or suppressing spruce beetle attacks on felled white spruce continued in 1985. The results of the 1985 field study did not live up to expectations; no significant reductions in beetle attacks were obtained in contrast to the 1983 study which resulted in significant prevention.

(3) An evaluation of trap trees treated with a silvicide (MSMA) was conducted on the Kenai Peninsula in 1985. Uninfested live spruce were treated with various concentrations and formulations of MSMA and were felled two weeks later prior to spruce beetle flight. The results of the study indicated that although the production of beetle brood was reduced by 98% for all treatments when compared to untreated check trees, a reduction in attack density was apparent. It is believed that the cool spring and summer weather conditions of 1985 retarded the translocation of MSMA throughout the trees. It has been shown that spruce beetles are repelled by high arsenic concentrations in the phloem.

(4) Participation in a cooperative effort with Alaska Agricultural Research Station and the Cooperative Extension Service to provide pest management information to Alaska residents. The program which includes education, research and survey activities, provides integrated pest management information concerning urban forestry and garden and greenhouse pests. This program includes a Teletip recorded message service as well as an IPM Newsletter which is published on a bi-weekly basis. This is mailed statewide and contains information on pest occurrence and available control measures. The mailing list includes growers, gardeners, professional government agency personel, and Alaska Master Gardeners who use this information for education purposes.

There were four full-time pest scouts and one half-time pest scout employed from May until September. In addition there are four Extension Agents working with the program. They devote approximately 135 person days to coordination, supervision, and education. The researchers from the Forest Service and ARS also contribute time. This amounts to about 85 days a year. They also provide assistance and laboratory facilities for classification of collected pests. These are catalogued and made into displays for Extension Agents to use in future educational programs.

(5) The initiation of a demonstration area in the Granite Creek area of the Chugach National Forest. More than 2,000 acres of spruce/hemlock forests as well as a developed campground have been set aside to promote vegetative management practices for the reduction and prevention of spruce beetle infestations. A variety of disciplines including recreation, fisheries and wildlife, timber, and pest management will be involved in this five year program. A selective cut of the Granite Creek Campground is scheduled for the 1985-6 winter with the specific purposes of increasing residual vigor and eliminating those spruce which are highly suceptible to spruce beetle attacks.

(6) The installation of a demonstration area for the control of hemlock dwarf mistletoe. The demonstration area, located near Thorne Bay on Prince of Wales Island, demonstrates forest management techniques for minimizing losses from dwarf mistletoe in young-growth hemlock stands.

(7) The testing of two chemicals–Orthene and Pydrin–for the prevention of spruce bud midge attack on spruce regeneration in the Snug Harbor area of the Kenai Peninsula. Insecticide application was undertaken in May of 1985. Treatment efficacy will be evaluated in the spring of 1986.

(8) The evaluation of selective herbicides for the control of brush and perennial grass was initiated in interior Alaska. The main objective of the test is to delineate the effectiveness of the herbicides in controlling competing vegetation and promoting increased survival and growth of white spruce regeneration. This study will continue for at least five years.

1985 FOREST INSECT AND DISEASE INFESTATIONS IN ALASKA BY OWNERSHIP AND PEST

IN ACRES

PEST	NATIONAL FOREST	OTHER FEDERAL	NATIVE	STATE & PRIVATE
SPRUCE BEETLE *Dendroctonus rufipennis*	34,101	91,588	58,270	72,255
ENGRAVERS *Ips perturbatus*		1,042		
LARGE ASPEN TORTRIX *Choristoneura conflictana*		162	1,230	794
SPEAR-MARKED BLACK MOTH *Rheumaptera hastata*				35,195
BLACK-HEADED BUDWORM *Acleris gloverana*	394		273	
LEAF ROLLER *Epinotia solandriana*			31,371	
HEMLOCK SAWFLY *Neodiprion tsugae*	21,450		5,925	600
SPRUCE NEEDLE RUST *Chrysomyxa ledicola*		1,402		
ALASKA-CEDAR MORTALITY (current discoloration only)	2,024			

TOTAL - INSECT: 367,029 ACRES [1]

TOTAL - DISEASE: 3,426 ACRES [2]

STATE TOTAL (Insect and Disease): 370,455 ACRES

[1] Including approximately 14,000 acres of defoliated hardwoods which were aerially detected in 1985. Causal agents were not identified but aphids and leaf rollers are suspected.

[2] These values do not include many of the most destructive diseases (e.g., decays and dwarf mistletoe) because these losses are not detectable in aerial surveys.

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SUBMITTING INSECTS AND DISEASE FOR IDENTIFICATION

People interested in obtaining positive identification of insect and disease specimens should submit samples to specialists. The following procedures for the collection and shipment of specimens should be used:

Specimen Collection:

1. Adequate material should be collected.
2. Adequate information: The value of an insect or disease specimen depends on the information regarding its collection.
    a. Where the specimen was collected: nearest Post Office or town, elevation, aspect, and so forth.
    b. When the specimen was collected.
    c. Who collected the specimen.
    d. Host description (age, species, and general appearance).
    e. General condition of the surrounding area (fire, blowdown, logging, and so forth).
3. Personal opinion of the problem is very helpful.

Shipment of Specimens:

1. General:
    a. Pack specimens in such a manner that breakage will be minimal.
2. Insects: Specimens sent through the mail should be packed to withstand rough treatment.
    a. Larvae and other soft-bodied insects should be shipped in small screw-top vials or bottles containing at leat 70% isopropyl (rubbing) alcohol. Make certain the bottles are sealed well. Include in each vial adequate information, or a code, relating the sample to the written description and information. Labels inserted in the vial should be written on with pencil or India ink. Do not use ball point pen as the ink is not permanent.
    b. Pupae and hard bodied insects may be shipped either in alcohol or in small boxes. Specimens should be placed between layers of tissue paper in shipping boxes. Pack carefully and make certain that there is very little movement of material within the box. Do not pack insects in cotton.
    c. Adult moths, butterflies, and fragile insects should be carefully placed between layers of tissue paper before packing.
3. Needle Diseases:
    a. Do not ship in plastic bags. Sprinkle lightly with water before wrapping in newspaper.
4. Mushrooms and Conks:
    a. Do not ship in plastic bags. Wrap in paper and ship in a box. Ship immediately in fresh condition, or air dry, then ship.

Shipping:

1. Ship as quickly as possible. If samples cannot be shipped rapidly, store them in a refrigerator.
2. Include address inside shipping carton.
3. Mark: "FRAGILE: INSECT-DISEASE SPECIMENS ENCLOSED; FOR SCIENTIFIC PURPOSES ONLY; NO COMMERCIAL VALUE".

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Please report or submit sample
of forest or urban tree insects or
disease to your local ALASKA
STATE FORESTRY OFFICE or to
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